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56. List of documents cited in the
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60. References to other related national
documents:

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54. METHOD FOR ASPIRATING THE SPINAL CORD FROM A BOVINE

57. Method making it possible to decrease the risks of contamination, particularly by the proteinaceous infections particle of BSE, during the butchering of bovine carcasses, this method being characterized by the fact that it is composed of the following steps:

a) after the head is removed from the carcass (B), a hollow holding component (20; 70), suitable for holding the dura mater (G) in place, is inserted from the neck side (C) into the medullary canal,

b) a tube (30) connected to a vacuum source is inserted through the holding component into the medullary canal, in order to suck out the spinal cord M.



The present invention concerns a method intended to be implemented in an abattoir prior to the butchering of carcasses.

5 The current trend is to seek to reduce the risk of contamination of beef by tissues that could be infected with the proteinaceous infectious particle of BSE (Bovine Spongiform Encephalitis).

A purpose of the present invention is a new method making it possible to decrease the risks of contamination during the butchering of bovine carcasses, this method being characterized by the fact that it is composed of the following steps:

10 a) after the head is removed from the carcass, a hollow holding component, suitable for holding the dura mater in place, is inserted from the neck side into the medullary canal,

b) a tube connected to a vacuum source is inserted through the holding component into the medullary canal, in order to suck out the spinal cord.

As a result of the presence of the above-mentioned holding component, the dura mater is held in place even when the tube is removed during the process of sucking out the spinal cord.

15 When there is no such holding component, the dura mater is held in place only by the spinal cord.

20 Once the spinal cord has been sucked out, the dura mater can become detached, and when the tube is removed then reinserted through the neck, it tends to form a blockage at the entrance of the medullary canal, hindering the insertion of the tube and requiring difficult manipulations by the operator.

The use of a holding component in the invention, therefore, makes it possible to suck out the spinal cord in a way that is reliable and fast enough to be compatible with the production demands of large abattoirs.

25 As a result of sucking out the cord, considered to be a high risk material, the spattering of the cord is avoided during the butchering of the carcass along the medullary canal with a band saw.

This prevents the dissemination into the atmosphere of particles of cord, thus decreasing the risk of contamination of healthy parts.

30 In one preferred implementation of the method according to the invention, the tube used has one rounded end so as not to damage the dura mater when it is moved inside the medullary canal.

This makes it possible to effect numerous forward-and-backward movements inside the medullary canal to exert a mechanical action that facilitates sucking out the spinal cord without damaging the dura mater.

5 Again according to a preferred implementation of the method according to the invention, the tube is fitted with a tool suitable for separating pieces of cord when it is moved inside the medullary canal.

For example, such a tool can be composed of a blade or fixed wire in the mouth of the tube, but more complex tools can be used, such as tools operated by a source of energy.

10 Again in a preferred implementation of the method according to the invention, the medullary canal is exposed to the air at the end opposite the neck, before insertion of the suction tube.

This exposure to the air is advantageously accomplished by means of a shear having a fixed component suitable for insertion into the anus of the animal and a movable blade making possible the removal, like a hollow punch, of the terminal region of the spinal column, considered
15 to be risky material.

The above-mentioned holding component can be composed of a single-use insert.

The holding component can also be reusable, and for example can be integral with a clamping device allowing it to be held in place, this clamping device being suitable for being fastened to the neck, for example.

20 The holding component can also be integral with a drive device for the tube, making it possible to assist in the insertion thereof into the medullary canal.

Thus, in one preferred implementation of the method according to the invention, the movement of the tube is assisted by a drive device, easing the burden on the operator.

25 Preferably the tube is inserted by a succession of ascending and descending movements, the upward movement being greater than the downward movement.

This succession of movements makes it possible to generate a mechanical action that promotes the removal of the spinal cord.

Again in a preferred implementation of the method according to the invention, the tube is removed from the medullary canal at least once before reaching the upper end thereof, to bring the tube out into the open air in order to facilitate the evacuation of the spinal cord debris contained therein.

5 Appropriately, during this intermediate step, water – preferably hot – is aspirated in order to promote the flow of the cord in the tube and to lubricate the tube.

A purpose of the invention is also a tube for the implementation of the above-mentioned method.

10 Thus a purpose of the invention is a tube for sucking out the cord contained in the medullary canal of a bovine carcass, this tube being characterized by the fact that it is composed of a flexible pipe, one end of which has a fitting that has a rounded outer end.

15 The fitting advantageously has an inner skirt attached to the flexible pipe, welded for example, this inner skirt being connected to a ring-shaped head – the outer surface of which is rounded – the ring-shaped head and the inner skirt forming an angle suitable for supporting the end section of the flexible pipe and preferably having appreciably the same length.

Advantageously, the fitting has a means suitable for exerting a mechanical action on the spinal cord, such as a cutting means.

20 This means, intended to exert a mechanical action on the cord, has for example a wire that extends – depending on the diameter of the inner skirt – between two opposite regions thereof.

An object of the invention is also a single-use holding insert for the implementation of the above-mentioned method.

25 An object of the invention is thus a single-use insert, characterized by the fact that it has a tubular body provided with means suitable for being applied against the dura mater at the neck.

Such an insert is appropriately produced by molding plastic material.

The insert can have a plurality of flexible blades that are elastically deformable in the radial direction.

30 The body of the tubular insert can have a conical surface at at least one of its axial ends, intended to facilitate the insertion of the insert into the medullary canal

or to facilitate the entry of the tube through the insert, or the centering of a drive unit for the tube.

A purpose of the invention is also a component for holding the dura mater of a bovine spinal column, this holding component being characterized by the fact that it has a hollow part generally in the shape of a truncated cone designed to press against the dura mater to hold it in place.

Such a holding component is appropriately integral with clamping means suitable for gripping the neck.

These clamping means are preferably operated by a hydraulic or pneumatic mechanism.

The holding component can also be integral with a mechanism for driving the tube.

Moreover, the holding component can be integral with a gripping means allowing the operator to hold it in place while the tube is being inserted or withdrawn from the medullary canal.

An object of the invention is also a device for driving a tube inside the medullary canal of a bovine carcass, this device being characterized by the fact that it has:

- clamping means suitable for being supported on the neck to hold the drive device in an appreciably fixed position with respect to the neck,

- drive means suitable for moving the tube with respect to the neck, at least in the direction of insertion in the medullary canal, and preferably also in the opposite direction.

These drive means, for example, have drive rollers that can come into contact with the tube to drive it by friction.

The drive device has appropriate control means for periodically reversing the direction of movement of the tube.

The tube can be furnished with a conduit to allow liquid, such as hot water, to be fed into the end inserted in the medullary canal, in order to facilitate the detachment of the cord and the aspiration thereof through the tube.

The tube can also have means to take motive energy to the end of the tube in order to operate a tool, for example,

intended to exert a mechanical action on the cord in order to break it up and facilitate its removal by aspiration.

The drive device for the tube can appropriately have a protruding part intended to enter the medullary canal in order to facilitate the insertion of the tube therein.

5 This protruding part can press against a single-use insert that had been previously inserted in the medullary canal.

The protruding part can also be used for putting the insert into the medullary canal.

10 An object of the invention is also a shear intended to expose the medullary canal of a bovine carcass to the open air at the end opposite to the neck, this shear being characterized by the fact that it has:

- a fixed part to be inserted in the anus of the animal,
- a blade that is movable with respect to the fixed part that makes it possible, like a hollow punch, to remove a part of the bovine carcass,
- means for driving the movable blade.

15 This blade appropriately has a U-shaped profile when observed in a direction perpendicular to the axis of pivoting and in the longitudinal direction of the fixed part, in order not to remove the rump steak of the animal.

20 The invention will be better understood from the following detailed description of non-limiting examples of implementation of the invention, and from examining the attached drawings in which:

- figure 1 diagrammatically represents a suspended carcass, head removed and with the end of the medullary canal opposite the neck exposed to the air,
- figure 2 is a partial diagrammatic cross section in a median plane of the spinal column of the bovine,
- 25 • figure 3 diagrammatically and partially represents a shear that makes it possible to accomplish the above-mentioned exposure to the air,
- figure 4 is a front view along arrow IV of figure 3,
- figure 5 represents a device for driving the tube, fixed on the neck,
- figure 6 very diagrammatically represents the tube drive mechanism,

- figure 7 represents the end of the tube,
 - figure 8 represents the insert to be placed in the opening of the medullary canal,
 - figure 9 illustrates the temporary attachment of the insert to the tube drive mechanism,
- and
- 5 ◦ figure 10 represents a variation of embodiment of the part that holds the dura mater.

Represented in figure 1 is a back view of a bovine carcass B vertically suspended in a traditional way by the animal's back feet P.

The carcass B has had the head removed.

10 A cut D with the hollow punch has also been made to expose to the open air the upper end of the medullary canal.

In the example in figure 1, the animal's tail is still on the carcass but it will not go beyond the scope of the present invention if it has previously been removed.

Represented very diagrammatically in figure 2 is the spinal column of the bovine carcass.

15 This column has an osseous structure O and a sheath G called dura mater, filled with the spinal cord M.

The lower part of the column constitutes the neck C, while the upper part S is exposed to the open air as a result of the cut D.

Represented in figures 3 and 4 is the shear 10 by which this cut D is made.

20 This shear 10 has a fixed part 11 intended to be inserted in the animal's anus and a blade 12 that can be pivotally driven with respect to the fixed part 11 by means of a drive mechanism not represented, such as a hydraulic or pneumatic mechanism.

The fixed part 11 has raised portions 13 to improve its being held in place in the animal.

When the blade 12 is pivotally driven until overlapping

the fixed part 11 by a small amount, it removes a part of the animal like a hollow punch.

The method according to the invention is implemented, in the example illustrated, by means of an insert 20 placed in the medullary canal, a suction tube 30 and a drive device 40 to assist the operator in moving the tube 30.

5 Inside a housing the drive device 40 has a roller drive mechanism 41, represented in figure 6, these rollers 41 being applied by friction to the tube 30 and being operated by a gear mechanism 42 and a motor 43, such as a pneumatic or hydraulic motor, connected to a control device 44 and to a source of energy (such as a source of compressed air) by a flexible tube 47.

10 The control device 44 allows the operator to select the direction of rotation of the rollers 41 and thus the movement upward or downward of the tube 30.

The drive device 40 has clamping means, which in the illustrated example are composed of arms or jaws 50 suitable for gripping the neck C, as can be seen in figure 5.

These arms 50 are operated by any appropriate mechanism, preferably pneumatic or hydraulic, not represented in order to simplify the drawing.

15 The tube 30, as represented in figure 7, has a flexible pipe 31 suitable for operating at negative pressure, provided with a fitting 60 at its end.

This fitting 60 has an inner skirt 61 welded or glued to the inner surface of the flexible pipe 31 and an external head 62, the outer surface 63 of which is rounded in order not to injure the dura mater G when the tube 30 is moved in the medullary canal.

20 The head 62 is connected to the inner skirt 61 by forming an angle 64 that rests against the end of the flexible pipe 31.

A cutting tool, such as a wire 70, is attached to the interior of the fitting 60, for example at two diametrically opposite places of the inner skirt 61.

The fitting 60 can be made of plastic or metal material.

25 If the fitting 60 is made of metal, the wire 70 is preferably metallic and is welded to the inner skirt 61.

The wire 70 can be replaced by any other component, such as a blade or other device, suitable for exerting a mechanical action

on the cord when the tube 30 is moved in the medullary canal. The insert 20 is represented by itself in figure 8. It has a tubular body 21, the inside diameter of which is large enough to allow the passage of the tube 30, this body 21 being furnished on the outside with a plurality of means that are elastically deformable in the radial direction, composed here of blades 22 that can bend
5 toward the tubular body 21 when the insert 20 is placed in the medullary canal.

The insert 20 is appropriately molded from plastic in a single piece.

The blades 22 are arranged so as to press the dura mater G against the osseous structure O when the insert 20 is put in place, in order to keep the dura mater G in position even in the absence of the cord M and the tube 30.

10 The insertion of the insert 20 in the medullary canal can be done using any suitable insertion tool.

It will be noted that in the form of embodiment described, the drive device 40 has a part 45 for forming a projection suitable for entering the medullary canal and the insert 20, as illustrated in figure 9, so as to guide the tube 30 inside the insert 20.

15 Moreover, the drive device 40 is used to put the insert 20 in place in the medullary canal.

The method according to the invention can be implemented as follows.

It is assumed that the carcass B is in the condition represented in figure 1, that is, it has had the head removed and the cut D has been made, for example by means of the shear 10 described above.

20 First, the insert 20 is placed in the end of the medullary canal that opens at the neck C, after having mounted the insert 20 on the part 45 of the drive device 40, so that the latter is used as an insertion tool.

The drive mechanism 40 is then put in place with the arms 50 opened, then moved toward each other so as to grip the flange of the neck, as represented in figure 5.

The tube 30 is connected to a suction unit, not represented, having means that make it possible to separate the air [sic] and recover the solid materials in a traditional way.

5 The progress of the tube 30 in the medullary canal is preferably accomplished by a succession of upward movements – of 20 centimeters, for example – followed by downward movements of a lesser distance – of 10 centimeters, for example – in order to exert a mechanical action on the cord that facilitates its detachment from the dura mater G and the formation of easily aspirated chips.

The operator activates the control device 44 so as to cause this succession of ascending and descending movements.

10 The operator proceeds in this way until reaching about half of the length of the spinal column, then withdraws the tube 30 in order to re-expose the medullary canal to the open air at the neck, as well as to expose the tube 30 to the open air.

15 Preferably, a certain amount of hot water is then aspirated in order to clean and lubricate the tube 30, then the tube 30 is reinserted in the medullary canal in order to suck out the second half of the spinal cord, proceeding with a succession of upward and downward movements as before.

20 As a result of the presence of the holding component 20, the reinsertion of the tube 30 into the lower part of the medullary canal, cleared of cord M, is accomplished without damaging and without moving the dura mater G, which thus does not hinder the reinsertion of the tube 30 and preserves its function as an impervious sheath.

Due to the rounded end of the tube 30, the dura mater G is hardly ever damaged.

If this were to occur, blood and air would be aspirated instead of the cord M and the process would no longer be able to be done correctly.

25 After the complete aspiration of the cord M, the drive device 40 is removed, the insert 20 remaining in place, and the carcass can be butchered in the traditional way with a band saw along the medullary canal.

The absence of cord M therein thus prevents the splattering of cord and the dissemination of potentially contaminated particles in the environment of the carcass B.

Obviously, the invention is not limited to the examples that have just been

described. In particular, a part that is generally in the form of a truncated cone 70 can be used as a holding component, as represented in figure 10, having on its outer surface a plurality of raised parts 71 intended to be wedged into the medullary canal against the dura mater G.

5 This type of holding component also has a conical lower opening 72 intended to facilitate the insertion of the tube 30.

The component 70 can be integral with a clamping device similar to the one represented in figure 5.

The holding component 70 can also be integral with a gripping device that allows the operator to participate in holding it on the neck while the tube is being maneuvered, if necessary.

10 The tube can be provided with means to make it possible to apply mechanical energy to the end inserted in the medullary canal, in order to cause the movement of a mechanism intended to exert a mechanical action on the spinal cord, for example a gimlet that can fragment the spinal cord.

15 The tube can also be furnished with a conduit allowing the injection of a fluid, such as hot water, into the medullary canal at the same time as the aspiration, in order to facilitate the removal of the cord M.

It does not go beyond the scope of the present invention when the movement of the tube is only produced manually, with no mechanical assistance.

CLAIMS

1. Method making it possible to decrease the risks of contamination, particularly by the proteinaceous infectious particle of BSE, during the butchering of bovine carcasses, this method
5 being characterized by the fact that it is composed of the following steps:

a) after the head is removed from the carcass (B), a hollow holding component (20; 70), suitable for holding the dura mater (G) in place, is inserted from the neck side (C) into the medullary canal,

10 b) a tube (30) connected to a vacuum source is inserted through the holding component (20; 70) into the medullary canal, in order to suck out the spinal cord (M).

2. Method according to claim 1, characterized by the fact that the tube (30) used has one rounded end so as not to damage the dura mater (G) when it is moved inside the medullary canal.

15 3. Method according to claim 1 or 2, characterized by the fact that the tube (30) is fitted with a tool (70) suitable for separating pieces of cord when it is moved inside the medullary canal.

4. Method according to claim 3, characterized by the fact that such a tool can be composed of a blade or fixed wire (70) in the mouth of the tube.

20 5. Method according to any of the preceding claims, characterized by the fact that the medullary canal is exposed to the air at the end opposite the neck, before insertion of the suction tube.

6. Method according to the preceding claim, characterized by the fact that the exposure to the air is accomplished by means of a shear (10) having a fixed component (11) suitable for insertion into the anus of the animal and a movable blade (12) making possible the removal, like a hollow punch, of the terminal region of the spinal column.

25 7. Method according to any of the preceding claims, characterized by the fact that the holding component is composed of a single-use insert (20).

8. Method according to any of claims 1 to 16, characterized by the fact that the holding component is reusable.

30 9. Method according to any of the preceding claims, characterized by the fact that the holding component is integral with a clamping device

allowing it to be held in place, this clamping device being suitable for being fastened to the neck (C), for example.

10. Method according to any of the preceding claims, characterized by the fact that the holding component is integral with a drive device (40), making it possible to assist in the insertion of the tube into the medullary canal.

11. Method according to any of the preceding claims, characterized by the fact that the movement of the tube is assisted by a drive device (40).

12. Method according to any of the preceding claims, characterized by the fact that the tube is inserted by a succession of ascending and descending movements, the upward movement being greater than the downward movement.

13. Method according to any of the preceding claims, characterized by the fact that the tube (30) is removed from the medullary canal at least once before reaching the upper end thereof, in order to bring the tube out into the open air.

14. Method according to any of the preceding claims, characterized by the fact that water – preferably hot – is aspirated after the removal of the tube (30) during this intermediate step, in order to promote the flow of the cord in the tube and to lubricate the tube.

15. Tube for the implementation of the method according to any of claims 1 to 14, characterized by the fact that it is composed of a flexible pipe (71), one end of which has a fitting (60) that has a rounded outer end.

16. Tube according to the preceding claim, characterized by the fact that the fitting has an inner skirt (61) attached to the flexible pipe (71), preferably welded, this inner skirt (61) being connected to a ring-shaped head (62), the outer surface (63) of which is rounded, the ring-shaped head and the inner skirt forming an angle (64) suitable for supporting the end section of the flexible pipe and preferably having appreciably the same length.

17. Tube according to either of claims 15 or 16, characterized by the fact that the fitting has a means (70) suitable for exerting a mechanical action on the spinal cord, such as a cutting means.

18. Tube according to the preceding claim, characterized by the fact that means intended to exert a mechanical action on the cord has a wire (70) that extends – depending on the diameter of the inner skirt – between two opposite regions thereof.

5 19. Tube according to any of claims 15 to 18, characterized by the fact that it is furnished with a conduit to allow liquid to be fed into the end inserted in the medullary canal.

20. Tube according to any of claims 15 to 19, characterized by the fact that it has means to take motive energy to the end of the tube.

10 21. Single-use insert (20) for the implementation of the method defined in any of claims 1 to 14, characterized by the fact that it has a tubular body (21) provided with means (22) suitable for being applied against the dura mater (G) at the neck.

22. Insert according to the preceding claim, characterized by the fact that it is produced by molding plastic material.

23. Insert according to claim 21 or 22, characterized by the fact that it has a plurality of flexible blades (22) that are elastically deformable in the radial direction.

15 24. Insert according to any of claims 21 to 23, characterized by the fact that the body (21) of the tubular insert has a conical surface at at least one of its axial ends, intended to facilitate the insertion of the insert into the medullary canal or to facilitate the entry of the tube through the insert, or the centering of a drive unit for the tube.

20 25. Holding component (70) for the implementation of the method as defined in any of claims 1 to 14, intended to hold the dura mater (G) of a bovine spinal column, characterized by the fact that it has a hollow part generally in the shape of a truncated cone designed to press against the dura mater to hold it in place.

26. Holding component according to the preceding claim, characterized by the fact that is integral with clamping means suitable for gripping the neck.

25 27. Holding component according to the preceding claim, characterized by the fact that the clamping means are operated by a hydraulic or pneumatic mechanism.

28. Holding component according to any of claims 25 to 27, characterized by the fact that it is integral with a mechanism for driving the tube.

29. Holding component according to any of claims 25 to 28, characterized by the fact that it is integral with a gripping means allowing the operator to hold it in place while the tube (30) is being inserted or withdrawn from the medullary canal.

30. Drive device (40) of a tube located inside the medullary canal of a bovine, for the implementation of the process as defined in any of claims 1 to 14, characterized by the fact that it has:

• clamping means (50) suitable for being supported on the neck to hold the drive device in an appreciably fixed position with respect to the neck,

• drive means (41, 42, 43) suitable for moving the tube with respect to the neck, at least in the direction of insertion in the medullary canal, and preferably also in the opposite direction.

31. Drive device according to the preceding claim, characterized by the fact that the drive means have drive rollers (41) that can come into contact with the tube to drive it by friction.

32. Drive device according to either of claims 30 and 31, characterized by the fact that it has appropriate control means (44) for periodically reversing the direction of movement of the tube.

33. Drive device according to any of claims 30 to 32, characterized by the fact that it has a protruding part (45) intended to enter the medullary canal in order to facilitate the insertion of the tube therein.

34. Drive device according to the preceding claim, characterized by the fact that the protruding part (45) can press against a single-use insert (20) that had been previously inserted in the medullary canal.

35. Drive device according to claim 33 or 34, characterized by the fact that the protruding part is used for putting the insert (20) into the medullary canal.

36. Shear intended to expose the medullary canal of a bovine to the open air

at the end opposite to the neck, for the implementation of the method according to any of claims 1 to 14, this shear being characterized by the fact that it has:

- a fixed part (11) to be inserted in the anus of the animal,
- a blade (12) that is movable with respect to the fixed part that makes it possible, like a hollow punch, to remove a part of the bovine,
- means for driving the movable blade.

37. Shear according to the preceding claim, the blade being pivoting, characterized by the fact that it has a U-shaped profile when observed in a direction perpendicular to the axis of pivoting of the blade and in the longitudinal direction of the fixed part.

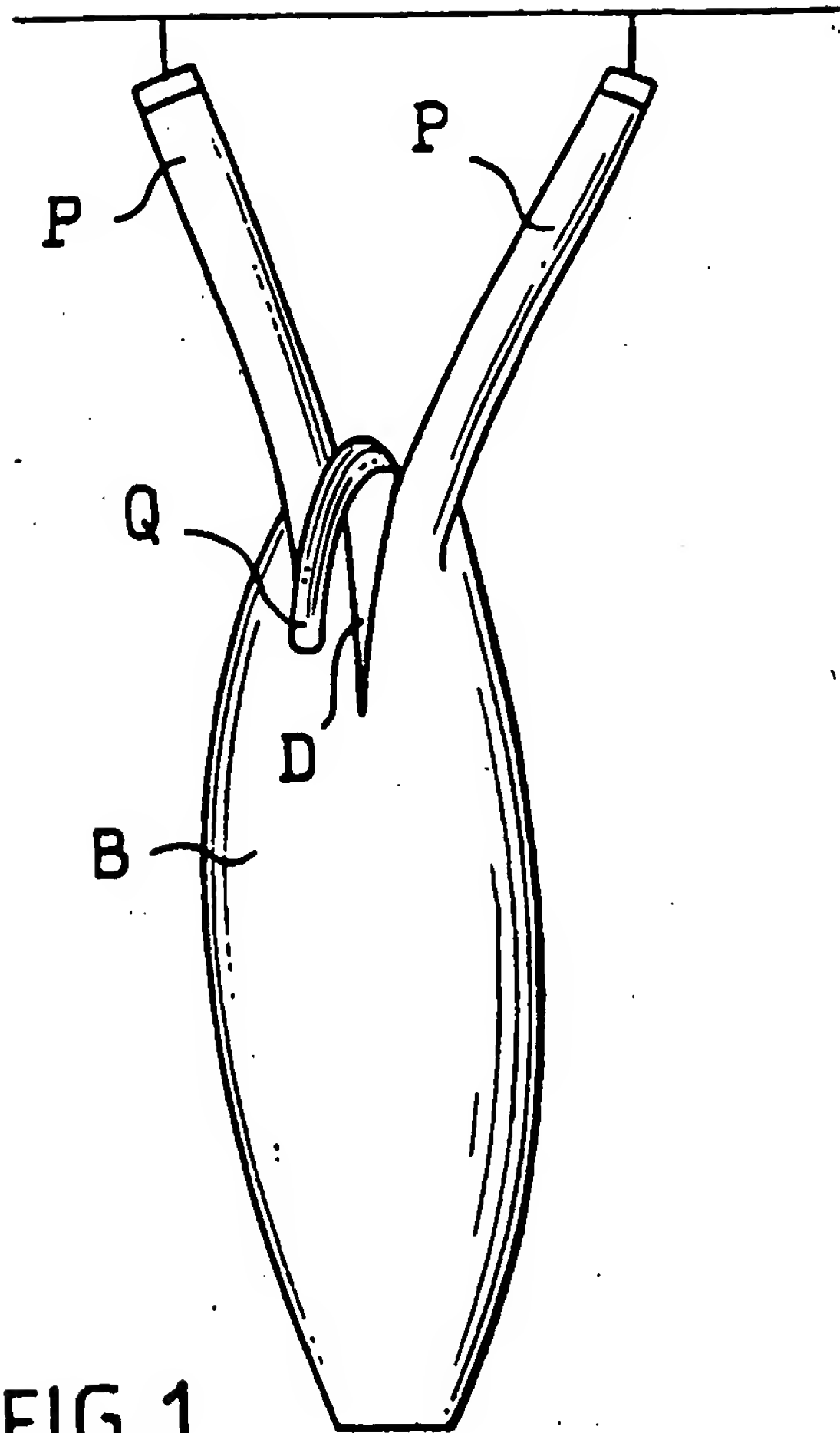


FIG. 1

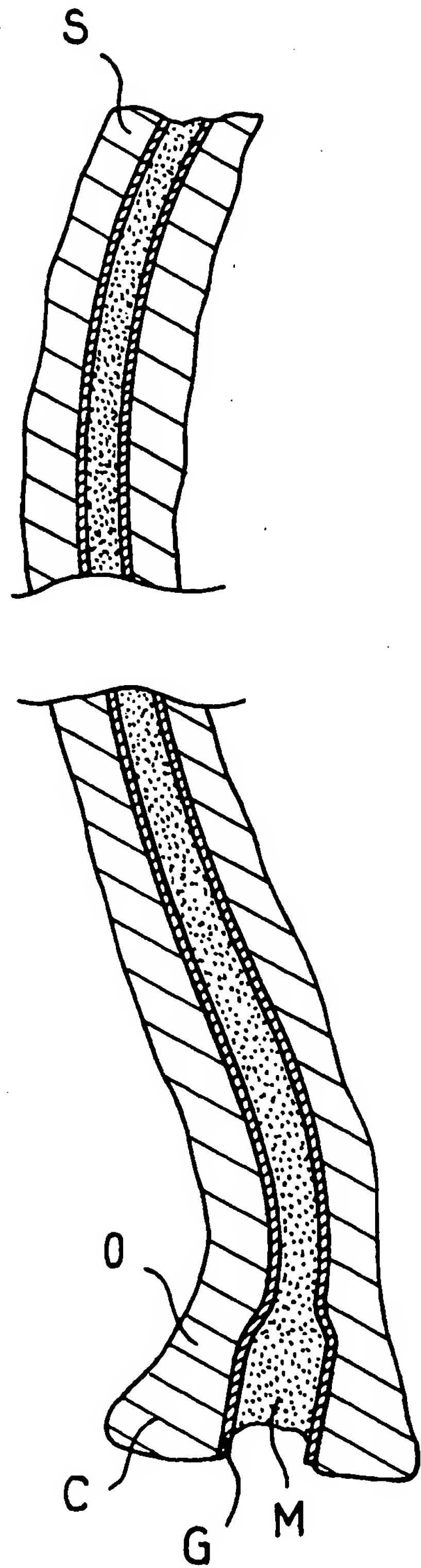


FIG. 2

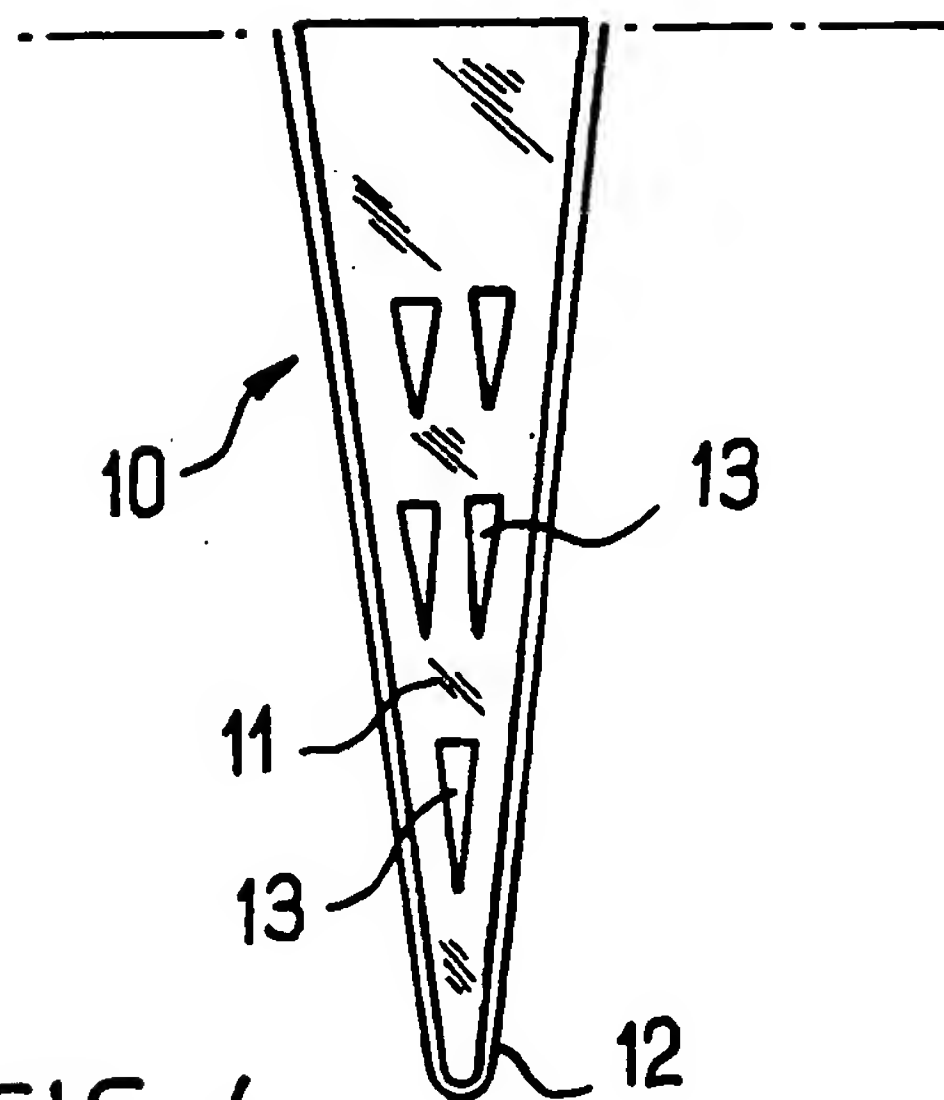


FIG. 4

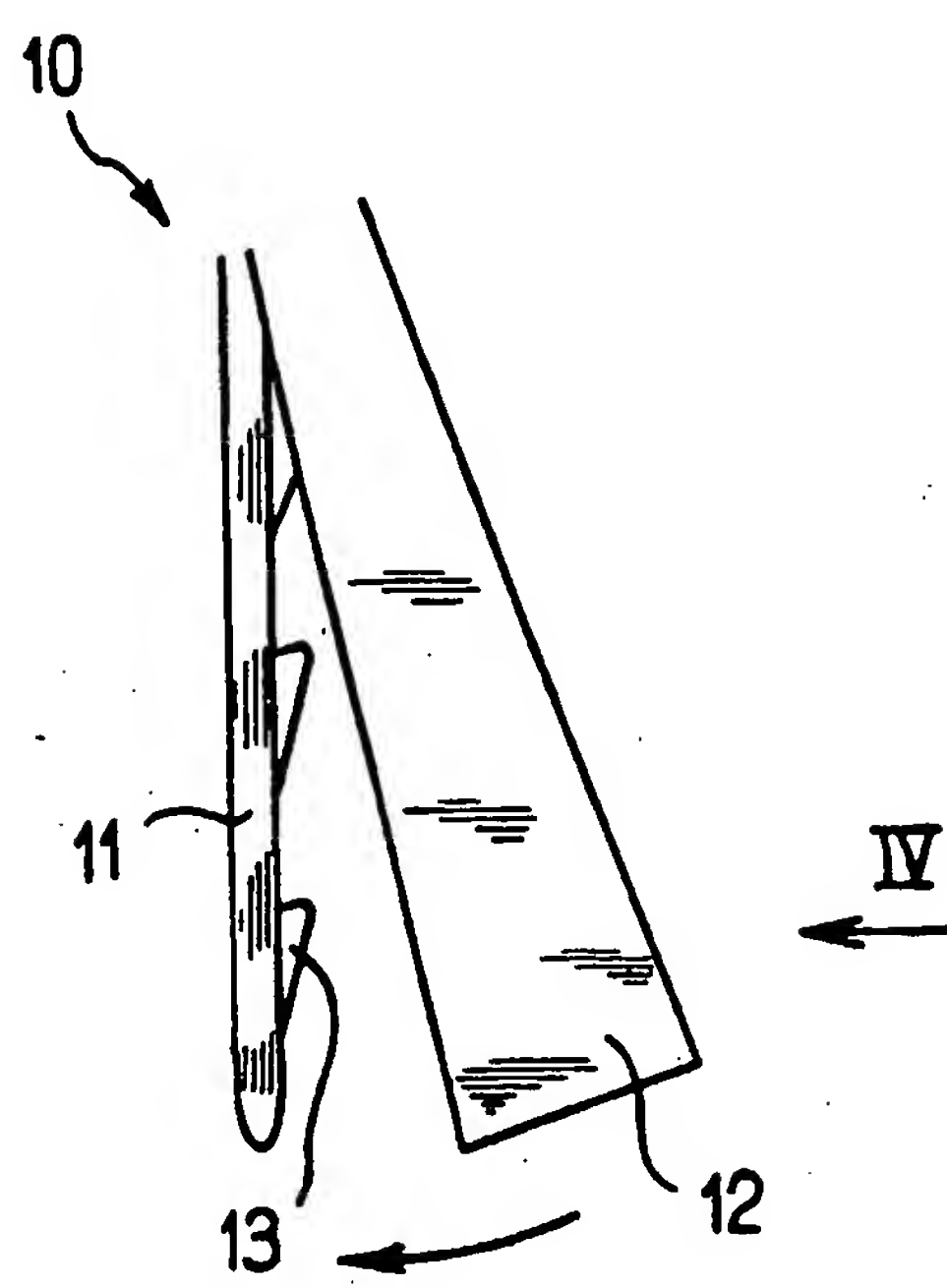


FIG. 3

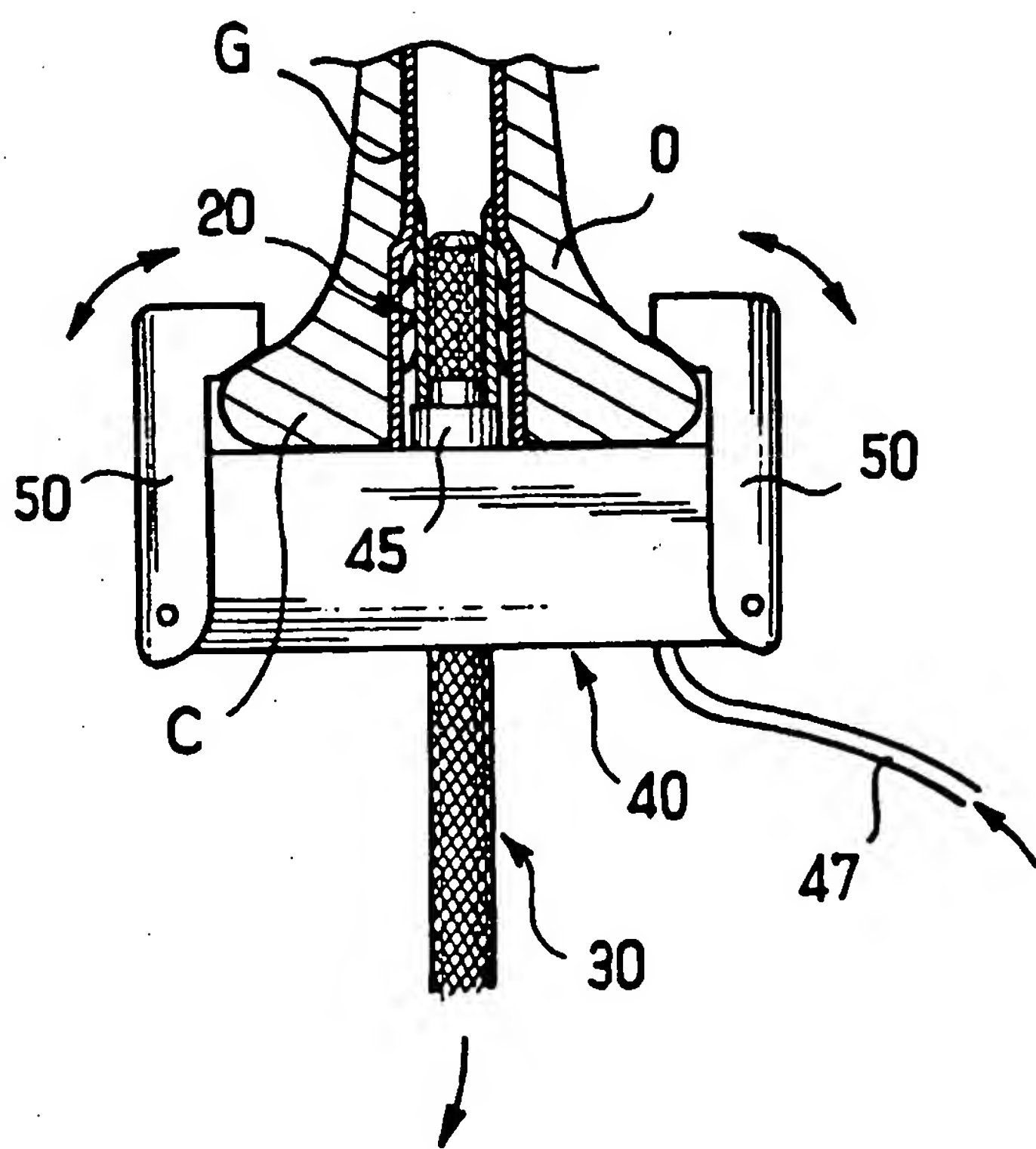


FIG. 5

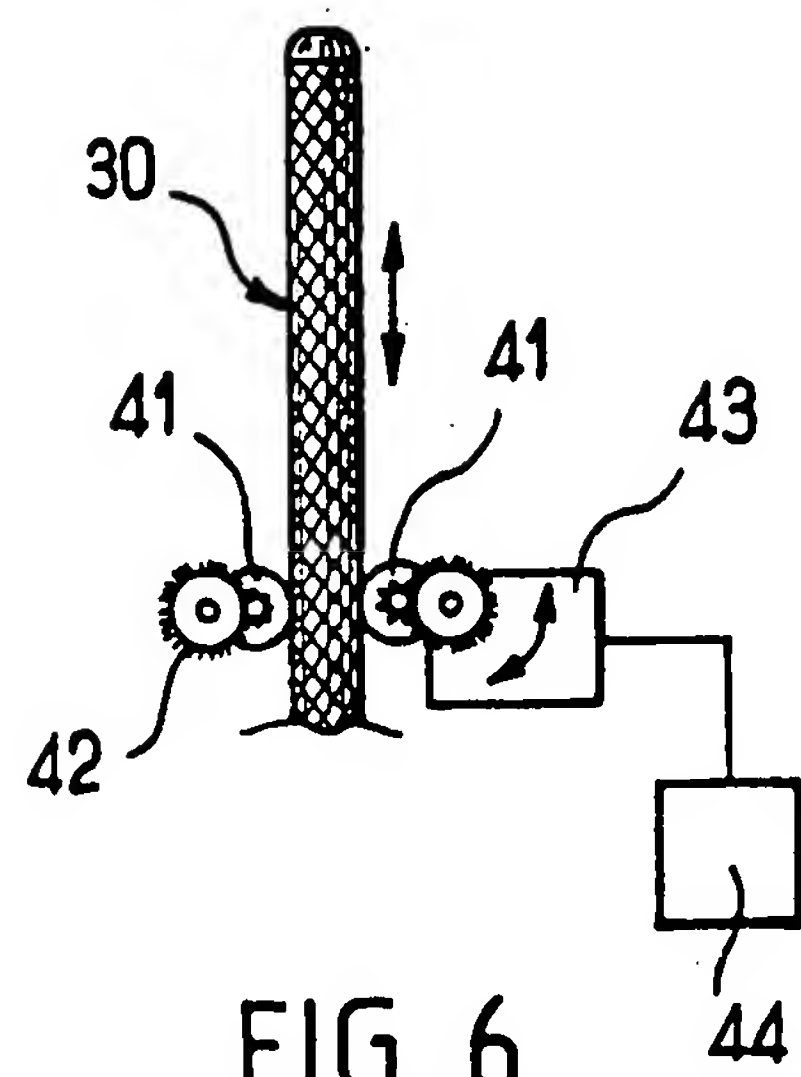


FIG. 6

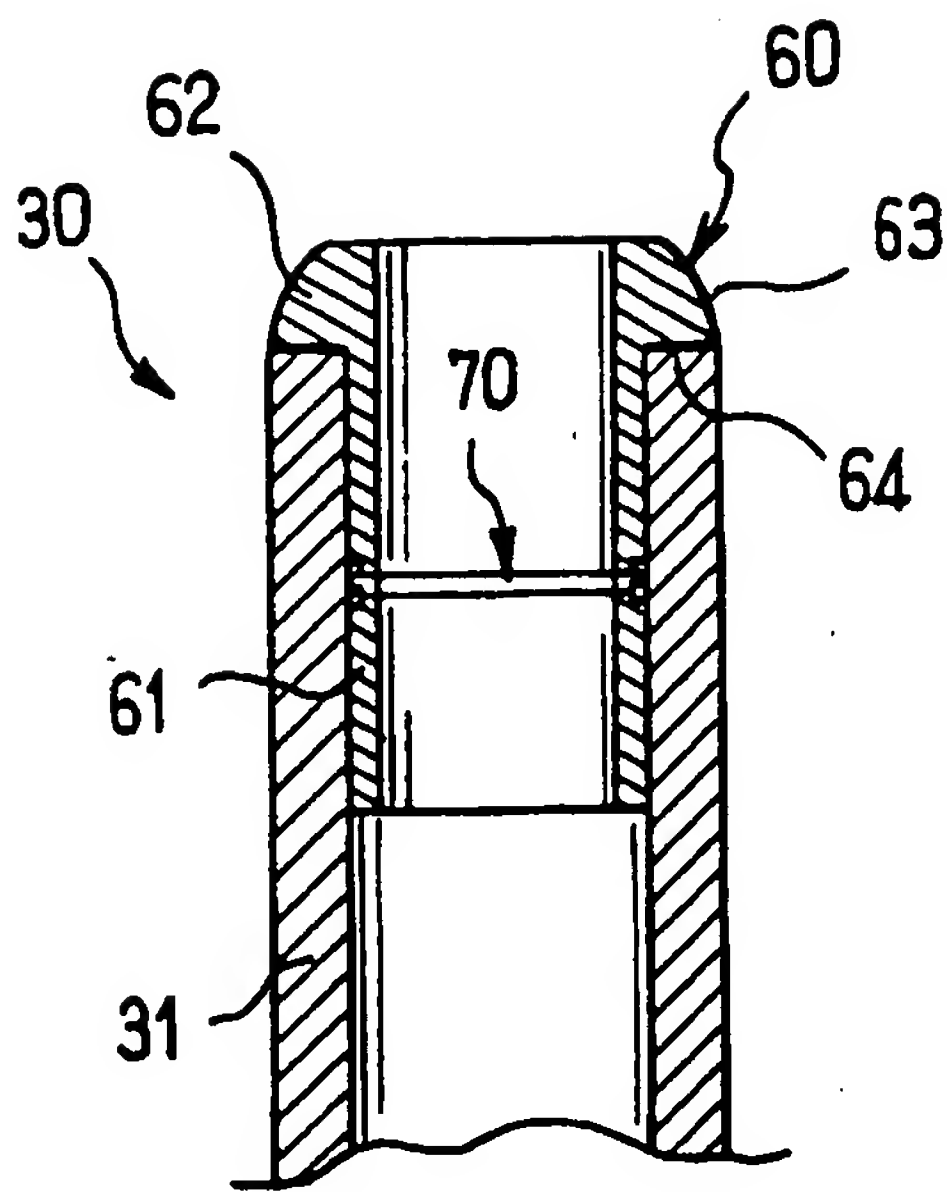


FIG. 7

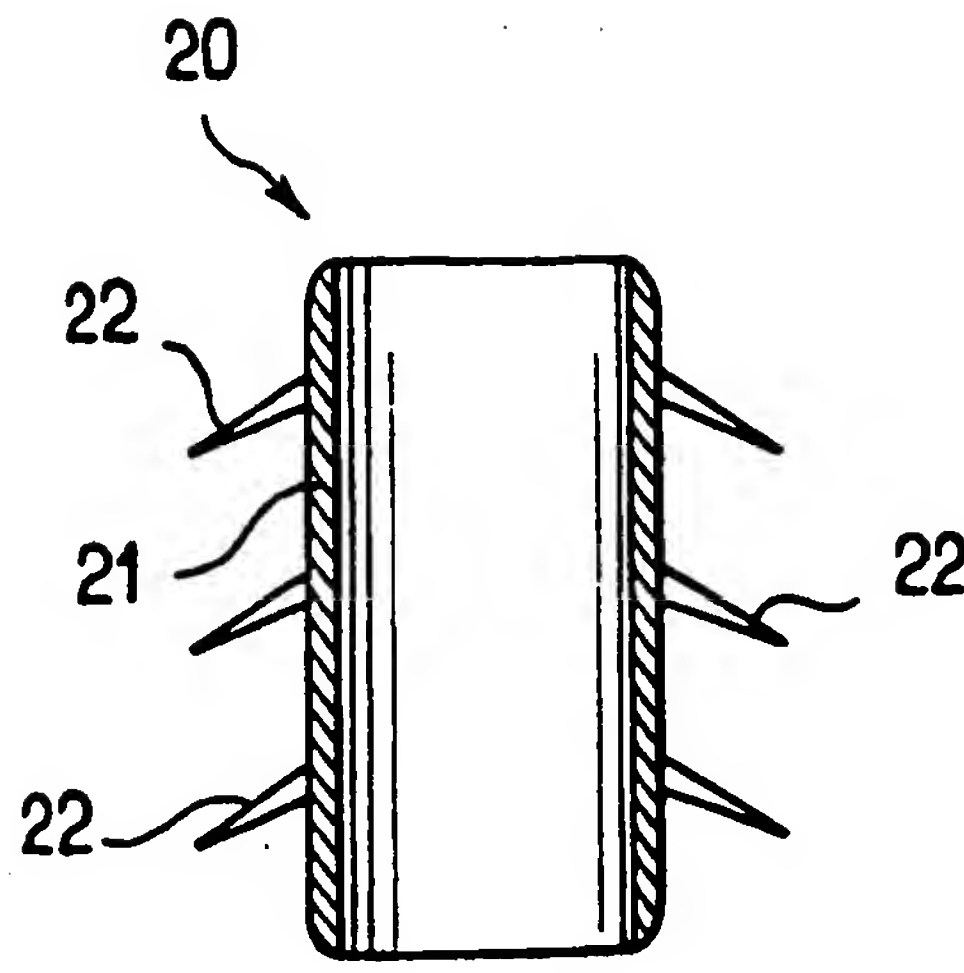


FIG. 8

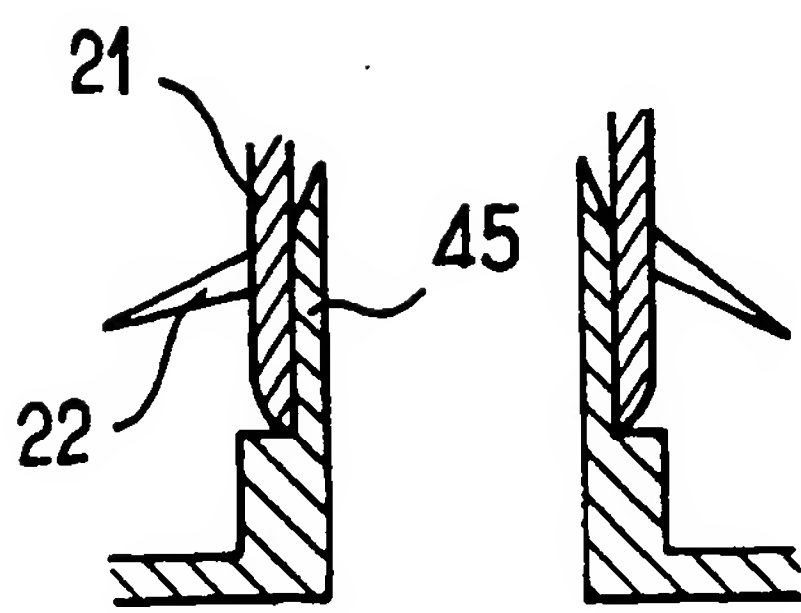


FIG. 9

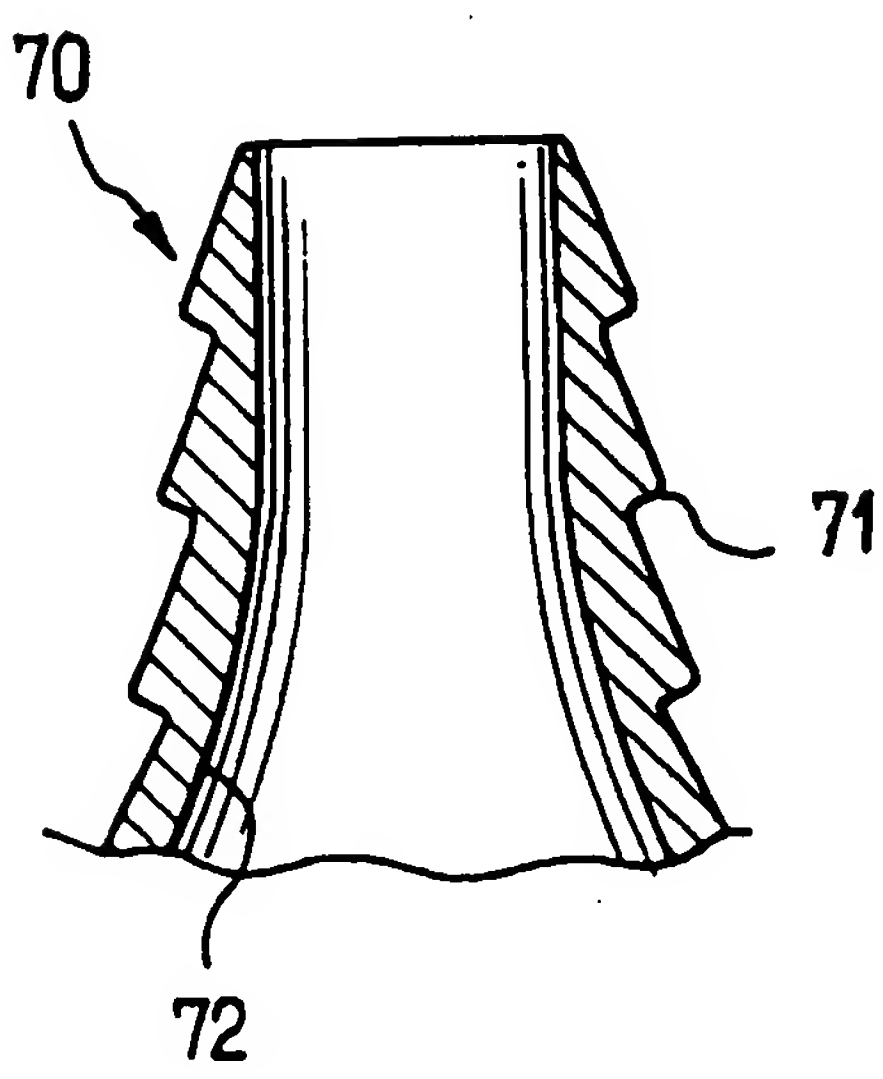


FIG. 10

French Republic
National Institute
of Industrial Property

2809929
National Reg. No.

**PARTIAL PRELIMINARY
SEARCH REPORT**

established on the basis of the latest claims
filed before the commencement of the search

FA 595144
FR 0014508

see SUPPLEMENTARY SHEET(S)

DOCUMENTS CONSIDERED TO BE PERTINENT		Claims concerned from the examined application	Classification given the invention by the INPI
Category	Citation of the document with indication, if needed, of the pertinent parts		
A	DE 197 57 745 C (BVS BERATUNG-VERKAUF- SERVICE FÜR DIE FLEISCHWIRTSCHAFT GMBH) January 7, 1999 (01-07-1999) * the entire document *	1-3	A22B5/00 A22B5/20
A	FR 2 759 866 A (ASSOCIATION NATIONALE INTERPROFESSIONNELLE DU BETAIL ET DES VIANDES) August 28, 1998 (08-28-1998) * the entire document *	1, 21, 25	
A	DE 198 24 966 A (FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.) December 16, 1999 (16-12-1999) * column 3, line 34 – column 4, line 8; figures 1-4 *	1, 21, 25	<div>TECHNICAL DOMAINS SEARCHED (Int. Cl.7)</div> A22B
Date of completion of the search 27 June 2001		Examiner V. von Arx	
CATEGORY OF DOCUMENTS CITED X : particularly pertinent by itself Y : particularly pertinent in combination with another document of the same category A : pertinent with respect to at least one claim or general technological background O : Unwritten disclosure P : Insert document		T : theory or principle on which the invention is based E : patent document benefiting from a date prior to the filing date and which has only been published on that filing date or on a subsequent date D : Cited in the application L : Cited for other reasons & : member of the same family, corresponding document	



2809929

ABSENCE OF UNITY OF INVENTION SUPPLEMENTARY SHEET B

Application No.
FA 595144
FR 0014508

The research division has determined that the present patent application does not meet the unity of invention requirement and concerns several inventions or a plurality of inventions, to wit:

1. Claims 1-14, 21-29

Method for aspirating the spinal cord and insert and holding component for this method.

2. Claims 15-20

Tube

3. Claims 30-35

Drive device for a tube

4. Claims 36, 37

Shear

The first invention has been researched.

The sole purpose of the definitions of the four groups of inventions is to identify these inventions concisely. It is possible that they have terms or generalizations that, after in-depth analysis, expand the defined subject beyond the contents of the application as filed.

Document DE-C-19757745, which is considered to represent the closest prior art, provides a device and a method of decreasing the risk of contamination, particularly by the proteinaceous infections particle of BSE, during the butchering of bovine carcasses. A flexible pipe is connected to a source of suction and is inserted in the medullary canal of a carcass that has had the head removed, in order to suck out the spinal cord.

The specific technical characteristics of the first group of inventions, which are supposed to be a contribution to this prior art, i.e., the application of a hollow holding component, resolve the problem of holding the dura mater in place during the aspiration of the spinal cord (independent claims 1, 21 and 25).

The specific technical characteristics of the second group of inventions, which are supposed to be a contribution to said prior art, i.e., a fitting with rounded outer end, resolve the problem of damaging the dura mater during the movement of a known suction tube in the medullary canal (independent claim 15).

The specific technical characteristics of the third group of inventions, which are supposed to be a contribution to said prior art, i.e., a drive device with clamping means and driving means for a spinal cord suction tube, resolve the problem of driving in an appropriate movement a known suction tube in the medullary canal (independent claim 30).

**ABSENCE OF UNITY OF INVENTION
SUPPLEMENTARY SHEET B**

Application No.
FA 595144
FR 0014508

The research division has determined that the present patent application does not meet the unity of invention requirement and concerns several inventions or a plurality of inventions, to wit:

The specific technical characteristics of the fourth group of inventions, which are supposed to be a contribution to said prior art, i.e., a shear with a fixed part, a blade and means for driving the blade, resolve the problem of exposing the medullary canal to the open air (independent claim 36).

No identical or similar specific technical characteristic can be identified for the different groups of inventions and different problems are apparently resolved. Moreover, it is clear that the four groups of inventions can be used independently of each other, i.e., they are not necessarily connected to each other.

This is the reason there seems to be no technical relationship between the different groups of inventions claimed apart from the known characteristic of aspiration of the spinal cord by means of a flexible suction tube. The four groups of claims are therefore not related by a single general inventive concept.